

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESS AND PROPERTIES INDEX																																																			
<p>18</p> <p>The role of sorption of nitrogen in the mechanism of ammonia synthesis in the presence of technical iron catalyst. S. S. Gankhman and V. A. Rolter, <i>J. Phys. Chem.</i> (U. S. S. R.) 11, 569-77 (1938); cf. Rolter, <i>et al.</i>, <i>C. A.</i> 30, 3707. —The adsorption of N and H on the tech. catalyst No. 340 (compn. is not disclosed) was investigated at -184-425° and -184-250°, resp., at a const. pressure of 435 mm. With H, a definite sorption process was observed in the region below 250°K. and another up to 500°K. The energy of activation of the low-temp. process increased from 7200 to 10,000 cal./mol. with increase of surface from 0.5 to 3.5 sq. cm. One type of N sorption was observed. The energy of activation of low-temp. adsorption of N was calcd. to be equal to 1500 cal./mol. The difference in the catalytic activity of the previously described Fe-Mo catalyst cannot be explained by difference in the magnitude of total surface, since the variation of the latter was inverse to the variation in the catalytic activity. The velocity of sorption process in the presence of this catalyst increased with the increase of the catalytic activity. The velocity of formation of NH₃ at 375° was near that of sorption of N under the same conditions. The energy of activation of the synthesis was considerably lower than that of the sorption of N. A. A. Podgorny</p>																																																			
<p>ASM-AIA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			
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<p>BC</p> <p>Electrochemical polarisation of metal electrodes. I. Mechanism of polarisation of the iron electrode. V. A. RUTEN, V. A. JUSA, and E. S. POLUJAN (Acta Physicochim. U.R.S.S., 1939, 10, 380—414).—An expression for the oscillogram of the anodic and cathodic polarisation of metal electrodes is derived, based on the mechanisms of discharge and ionisation lag, and has been investigated for Fe electrodes prepared by various methods. The deviation of the experimental oscillogram from that calc. is explained by reference to the velocity of discharge and ionisation. The surface of the electrode is polarised to an extent depending on c.d. The reason for "overpolarisation" and for the usual non-agreement of the current strength-potential curve with the equation of the discharge theory is explained. The calculation from oscillogram data of the abs. velocities of the ionisation and discharge processes is indicated. The peculiarity of the electrochemical behaviour of Fe electrodes in having a small final velocity of the ionisation and discharge processes is shown to agree with calc. vals. for metals of the Zn type. W. R. A.</p>																										<p>17 1</p>																									
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			
<p>STONY BROWNE</p>																																																			

1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX										3RD AND 4TH ORDERS									
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<p>Electrochemical polarisation of metal electrodes. II. Polarisation of zinc electrode. V. A. ROITSE, E. S. POLUJAN, and V. A. JUSA (Acta Physicochim. U.R.S.S., 1939, 10, 845-858; cf. preceding abstract).—The cathodic and anodic polarisation of single crystals of Zn have been studied by an oscillographic method. The relation between polarisation overvoltage and current intensity is the same as that which holds for gas electrodes, apparent differences being due to changes in the electrode surface during polarisation. With single crystals of Zn two kinds of change may occur, viz., increase of the surface area and of the activity of the surface. The velocity of the ionisation and discharge processes at an electrode surface in equilibrium with the solution is calc. to be $\sim 10^{-10}$ g.-ion per sq. cm. per sec. The polarisation of Fe and Zn electrodes is compared. O. J. W.</p>																													
<p>ASS. S. L. A. METALLURGICAL LITERATURE CLASSIFICATION</p>																													
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PROCESSES AND PROPERTIES INDEX																																																			
<div style="display: flex; justify-content: space-between;"> ca 2 </div> <p>Comparative characteristics of the adsorptive and catalytic properties of variously prepared synthetic ammonia iron catalysts. S. S. Gaukhman and V. A. Rotter. <i>J. Phys. Chem.</i> (U. S. S. R.) 13, 503-0 (1939); cf. C. A. 13, 4380. — Adsorption isotherms for H and N on 2 Fe catalysts promoted by 2% Al₂O₃ are given for temps. from 181 to 425°. Phys. adsorption was found at 181°, two types of activated adsorption at 250–425° on the sintered catalyst only. For the ammonia synthesis at 300–385° the catalytic activity of the sintered catalyst was proportional to the activated adsorption. F. H. R.</p>																																																			
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION																																																			
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KORNEYCHUK, G.P.; ROYTER, V.A.; ZHIGAYLO, Ya.V.

Ways of increasing the effect and selectivity of vanadium oxide
catalysts for the oxidation of naphthalene to phthalic anhydride.
Khim. prom. no.7:410-413 O-N '58. (MIRA 11:12)
(Naphthalene) (Phthalic anhydride) (Vanadium oxides)

ROYTER, V.A.; KORNEYCHUK, G.P.; STUKANOVSKAYA, N.A.; REAYEV, P.B.

Effect of transfer phenomenon on the kinetics of sulfur dioxide
oxidation on a barium aluminovanodate catalyst. Part 1: Diaphragm
method of analysis. Zhur.fiz.khim. 32 no.11:2525-2531 N '58.
(MIRA 12:1)

1. Akademiya nauk Ukrainiskoy SSR, Institut fizicheskoy khimii imeni
L.V. Pisarzhevskogo, Kiyev.
(Oxidation) (Sulfur dioxide) (Catalysis)

ROYTER4V8A8

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1. ROYTER, V.A., RADCHENKO, V.A.

2. USSR (600)

"The Kinetics of the Processes of the Chemical Interaction of Gases with Solids," Zhur. Fiz. Khim. 13, no.7, 1939. Acad of Sciences Ukrainian SSR Institute of Physical Chemistry imeni L.V. Pisarzhevskiy. Recieved 13 Sep 1938.

PP-896-900

9. Report U-1615, 3 Jan 1952.

COMMON ELEMENTS		COMMON VARIABLE MOET	
1ST AND 2ND ORDER		3RD AND 4TH ORDER	
PROCESSES AND PROPERTIES INDEX			
<p>Adsorption properties of differently prepared iron catalysts of the same composition. V. A. Kotter and S. S. Gaukhman. <i>Ber. Pissarjevsky Inst. physik. Chem., Akad. Wiss. Ukr. S. S. R.</i> 12, 3-11 (in Russian, 12; in German, 12-13) (1940).—Study was made of the nature of adsorption of H_2 and N_2 within the interval of -184° to $+425^\circ$ on two Fe catalysts used in the synthesis of NH_3. The catalysts contained 98% Fe_2O_3 and 2% Al_2O_3. One of the catalysts was fused in an elec. arc. Three types of sorption of H_2 were observed; phys. sorption at 184° and 2 types of activated sorption analogous to pure Fe and other promoted catalysts. With the fused catalyst there was activated sorption of N_2 at $250-425^\circ$ with measurable speed, but there was no practically measurable sorption of N_2 on the unfused catalyst. Measurements were also made of the kinetics of NH_3 synthesis (both catalysts were used). The catalytic activities are compared with the sorption characteristics.</p> <p style="text-align: right;">B. Z. Kamich</p>			
ASA-SLA METALLURGICAL LITERATURE CLASSIFICATION			
1ST AND 2ND ORDER		3RD AND 4TH ORDER	
1ST AND 2ND ORDER		3RD AND 4TH ORDER	

ROYTEI, V. A.

"Catalytic Oxidation of Acetylene"

BOYER, V. A.

"The Kinetics of the Synthesis of Ammonia."

Zhur. Fiz., Khim., Vol. 14, No. 9-10, 1940.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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<p>CA</p> <p>Kinetics and mechanism of catalytic conversion of carbon monoxide. V. A. Rojter, S. S. Gankhman, N. P. Pisharshevskaya, and T. M. Gvaliya (Inst. Phys. Chem. Acad. Sci. U.S.S.R.). <i>J. Applied Chem.</i> (U.S.S.R.) 18, 439-49(1945)(English summary).—The dependence of yield of CO conversion to H and CO₂ in the presence of H₂O was studied with the following factors: space velocity, total and partial pressures of the components, between 400° and 600° over K-carbon catalyst and Fe oxide catalyst of "nitrogen" type. The results are explained by a new theory for the K-carbon catalyst in which the following scheme of reactions is proposed: $2\text{KOH} + \text{CO} = \text{K}_2\text{CO}_3 + \text{H}_2$; $\text{K}_2\text{CO}_3 + \text{H}_2\text{O} = 2\text{KOH} + \text{CO}_2$, with summary result: $\text{CO} + \text{H}_2\text{O} = \text{H}_2 + \text{CO}_2$. In case of the Fe catalysts there is evidence for considerable effect of the following reaction sequence; $2\text{CO} = \text{CO}_2 + \text{C}$; $\text{C} + 2\text{H}_2\text{O} = \text{CO}_2 + 2\text{H}_2$. G. M. K.</p>																																																			
<p>458-51A METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			

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<p>PROCESSES AND PROPERTIES INDEX</p> <p>13</p> <p>Purification of air by removal of admixture of acetylene by oxidation. V. A. Rolter, M. Ya. Rubanik, Yu. A. Snigurovskaya and E. A. Saizovnikova (Inst. Phys. Chem. Acad. Sci. U.S.S.R.). <i>J. Applied Chem. (U.S.S.R.)</i> 18, 450-8(1945)(English summary).—It was shown that C_2H_2 can be removed from air by oxidation in passage over the following catalysts: MnO_2, Mn ore promoted by Ag salts. The former is effective over a wide concn. range, the latter only for small concns. Various factors involved were studied. Generally, 180° is a sufficiently high temp. for complete removal of C_2H_2. G. M. Kosolapoff</p>			
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<p>Catalytic oxidation of hydrogen sulfide in the presence of hydrogen. V. A. Roter, S. S. Garkhman, and M. A. Tudorovskaya. <i>J. Applied Chem. (U.S.S.R.)</i> 18, 450-48(1945)(English summary).--The efficiency of a Ni-Pt catalyst on kieselguhr for the reaction of oxidation of H_2S in the presence of O, N, and H was studied in relation to temp., space velocity, H_2S concn., O concn., and moisture. The reaction is exceedingly complex, with possibility of numerous parallel reactions, the probability of which is considered theoretically. The extent of oxidation depends primarily on temp. and the ratio of O to H_2S; this ratio is 2.5-4.0 for complete oxidation, with an apparent temp. max. at 370°. G. M. K.</p>																																																			
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[illegible]

ROUTER KA

The reduction magnetization of iron oxide ores. V. A. Roiter, V. I. Karmarin, V. A. Yuza, and A. N. Kuznetsov. *Dnepropetrovsk Chem. Technol. Inst., Dnepropetrovsk, Ukr. Pis. Khim.* 27, 125-9 (1953). The effective reduction of magnetization of iron oxide ores requires the selection of conditions favoring the stepwise reduction of the oxide throughout its entire mass, thereby avoiding diffusion inhibition. Reduction by H_2 favors a stepwise reaction more than the use of CO. However, in the reduction of a long layer of ore, H_2 is not useful owing to small concns. of water vapor formed in the first step which act as an inhibitor. Mixts. of CO and H_2 have many advantages in this type of reduction. J. Roitar Leach

ROYTER, V.A.; GAUKHMAN, S.S.

Effect of macrokinetic factors on the selectivity of catalysis.
Dop. AN URSS no.2:34-36 '49. (MLRA 9:9)

1. Institut fizichnoi khimii im. L.V. Pisarzhevs'kogo AN URSS,
Kiev i Khimiko-tekhnologichnyi institut im. F.Ye. Dzerzhins'kogo,
Dnipropetrovsk. Predstaviv diysniy chlen AN URSS O.I. Brods'kiy.
(Catalysis)

ROYTER, V.A.; KORNIYCHUK, G.P.; LEPERSON, M.G., [deceased];
STUKANOV'S'KA, N.O.; TOLCHINA, B.I.

Method of diaphragms for studying porous catalysts and kinetics
of reactions occurring on them. Dop. AN URSS no.2:41-47 '49.
(MLBA 9:9)

1. Institut fizichnoi khimii im. L.V. Pisarzhevs'kogo AN URSS.
Predstaviv diysniy chlen AN URSS O.I. Brods'kiy.
(Catalysts)

ROYTER, V.A.

✓ The role of macrokinetic factors in heterogeneous catalysis. V. A. Royter. *Problemy Kinetiki i Kataliza*, Akad. Nauk S.S.S.R. 6. *Geterogennyi Kataliz* 357-62 (1949).—The effect of macrokinetic factors (diffusion, heat transfer) on catalytic processes, specifically the oxidation of C_2H_4 and the selective oxidation of H_2S , are discussed. The discrepancy between theory and expt. is attributed to these factors. J. Rovtar Leach

CA

2

Role of transfer phenomena in catalysis on porous contacts. V. A. Rolter (Acad. Sci. Ukr. S.S.R., Kiev). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 576-81. With porous catalysts, the concns. of the reactants evidently decrease from the periphery of each granule towards its center, owing to diffusional hindrance. Consequently, application of kinetic mass-action laws, without regard to rates of diffusion, must of necessity involve a serious error, the greater the higher is the kinetic order of the reaction. Conditions on a porous catalyst grain are approximated by a model (C.A. 44, 8214f), wherein the catalyst is carried on a diaphragm sepg. the reaction space into 2 compartments. The reacting gas mixt. is first allowed to flow on both sides of the diaphragm, then the flow is stopped on one side, but continued on the other; the 1st side thus becomes a closed space. The stationary concn. c_0 in that closed space, different from the stationary c_0 on the flow side, corresponds to the concn. in the center of a catalyst granule of a radius equal to the thickness of the diaphragm. In the more general case of N spherical granules of radius r and vol. v , in a gas stream of mean concn. c_0 and rate of flow V , the rate of reaction is $W = -dx/dt = kNvVf(c)$. Along an infinitely thin layer of thickness dr , where the concn. can be considered const., $dV = -kNS_rVf(c)dr$, where S_r = external surface area of each granule, $dr = NS_rdr$. The amt. reacted is compensated by diffusion, which gives $d^2c/dr^2 = (kV/D)f(c)$, where D = effective diffusion coeff. Integration and combination with $W = -DNS_r(dc/dr)$ give $W = NS_r(2kDV)^{1/2} (\int f(c)dc)^{1/2}$.

This equation is applicable to the case of a single granule, or a diaphragm, with $N = 1$. The same equation, with $NS_r = 3/r$, applies to the sp. rate W_0 , referred to 1 cc. of catalyst, consisting of N grains, $N = 1/v$, with $V = V_0$ = flow rate referred to 1 cc. of catalyst. For an n -th order reaction, $f(c) = c^n$, and $W_0 = (3/r)[2/(n+1)]^{1/2}(kDV_0)^{1/2}(c_0^{n+1} - c_s^{n+1})^{1/2}$ and, at $c_s = 0$ (Zel'dovich range), $W_0 = (3/r)[2/(n+1)]^{1/2}(kDV_0)^{1/2}c_0^{(n+1)/2}$ identical with Z.'s equation (Zhur. Fiz. Khim. 13, 163(1939)). With the substitution $c_s = \alpha c_0$, the equation reads $W_0 = (3/r)[2/(n+1)]^{1/2}(kDV_0)^{1/2}(1 - \alpha^{n+1})^{1/2}c_0^{(n+1)/2}$. Graphs of the function $(1 - \alpha^{n+1})^{1/2}$ for $n = 0, 1$, and 2 show that application of Z.'s equation, i.e. the simplification $c_s = 0$, causes an error not greater than 5%, for $0 < \alpha < 0.1$ at $n = 0$, or $0 < \alpha < 0.3$ at $n = 1$, or $0 < \alpha < 0.45$ at $n = 2$. In other words, the higher the order of the reaction, the broader the range of applicability of Z.'s law in the direction of low temps. At the other extreme, towards $\alpha \rightarrow 1$, integration gives $(1 - \alpha^{n+1})^{1/2} \sim r[2/(n+1)]^{1/2}(kV/D)^{1/2}c_0^{(n-1)/2}$; this holds over the whole range of α from 0 to 1, if $n = 0$; the higher the order of the reaction, the closer must α be to unity for Z.'s equation to be applicable. Thus, at $n = 1$, it is valid from $\alpha = 1$ down to $\alpha = 0.8$, but at $n = 2$, its validity is confined to α from 1 to 0.98. These limits correspond to the range of applicability of purely kinetic equations, of the form $W_0 \sim kVc_0^n$. On porous catalysts, a kinetic region in the literal sense does not exist. A kinetic equation, taking no account of diffusion, will be practically applicable within a certain range of α , the narrower the range the higher is the kinetic order. For a 2nd-order reaction, a purely kinetic range is practically nonexistent. N. Thon

ROYTER, V. A.

V. A. Royter, G. P. Korneychuk, M. G. Leperson, N. A. Stukanovskaya, and B. I. Tolchina, Academy of Sciences Ukrainian USSR, Institute of Physical Chemistry imeni L. V. Pisarzhevskiy, Kiev

"Experimental Investigations of Macrokinetic Phenomena on Porous Catalysts"
(Zhurnal Fizicheskoy Khimii, Vol XXIV, No. 4, 1950.

The material presented in this article is of importance from the point of view of the theory of catalysts and of kinetics of combustion. Aside from the purely theoretical significance of the investigations reported, upon, the results and techniques in question are of practical interest, because acetylene may be used as a fuel, and may be set off in the presence of oxygen by means of a solid catalyst such as manganese dioxide in some appliance where the combustion-of the first gas furnished the driving power. (Digested translation available)

ROYTER, V. A.

PA 190T20

USSR/Chemistry - Iron
Metallurgy - Ferrous

Aug 51

"Mechanism of the Reduction of Iron Oxides With Hydrogen, Carbon Monoxide, and Mixtures of These Two Gases," V. A. Royter, V. A. Yuza, A. N. Kuznetsov, Chem-Technol Inst Imeni F. E. Dzerzhinskii, Dnepropetrovsk

"Zhur Fiz Khim" Vol XXV, No 8, pp 960-970

Investigated reduction with H_2 , CO, and H_2+CO of chemically pure Fe_2O_3 powder in range 200-3000 C. Could achieve reduction in stages corresponding to definite oxides. Found that CO is more active reducing agent at low temps than H_2 ; that activation

190T20

USSR/Chemistry - Iron (Contd)

Aug 51

energy of Fe_2O_3 reduction with H_2 is 30 kcal. with CO 28 kcal; that stage $Fe_2O_3 \rightarrow Fe_3O_4$, as distinguished from $Fe_3O_4 \rightarrow Fe$, does not proceed autocatalytically; that action of CO and H_2 is not additive, because presence of CO expedites use of H_2 . Proposes reaction mechanism which is in accordance with observed phenomena.

LC

190T20 ✓

ROYTER, V.A.

Some problems in the theory of catalysis. Ukr.khim.zhur. 19 no.2:
119-127 '53. (MLRA 7:4)

1. Institut fizicheskoy khimii im. L.V.Pisarzhevskogo Akademii nauk
USSR. (Catalysis)

ROYTER, V.A., professor, doktor khimicheskikh nauk (g. Kiyev).

Catalysis. Tekh.molod. 21 no.7:16-18 J1 '53.

(MLRA 6:8)

(Catalysis)

ROYTER, V. A.

USSR/Chemistry - Iron Ore Treatment Jan 53

"Characteristics of the Process of Reductive Magnetization of Iron Oxide Ores," V.A. Royter, V.I. Karmazin, V.A. Yuza, and A.N. Kuznetsov, Dnepropetrovsk Chem-Technological Inst im F. E. Dzerzhinskiy, Krivoy Rog Sci-Research Ore Mining Inst

Zhur Fiz Khim, Vol 27, No 1, pp 125-129

Effective reductive magnetization of iron oxide ores demands the selection of conditions favorable to gradual rather than zonal reduction of the oxides in the entire mass of the lumps or the whole

268T20

layer of ore. Diffusion interferes with gradual reduction. In the reduction with H of individual pieces of quartzite, the gradual manner of the reduction is much more pronounced than in reduction with CO. H is hardly suitable for the reduction of a sufficiently long layer, because of the strong inhibiting effect of H₂O on the first stage of the reduction of Fe₂O₃. As a result of this inhibition formation of zones in the ore must occur. Gases containing a mixture of H and CO are of considerable advantage.

ROFTER, V. A.

62 ✓ Investigation of the catalytic reaction of synthesis of ammonia by the diaphragm method. V. A. Rofter, G. P. Kornelchuk, N. A. Stukanovskaya, and Ts. V. Pevzner (L. V. Pisarzhevskii Inst. Phys. Chem., Acad. Sci. Ukr. S.S.R., Kiev). *Zhur. Fiz. Khim.* 28, 1638-51 (1954); cf. *C.A.* 49, 13748f. — In order to det. the effect on the synthesis of NH_3 in the presence of an Fe catalyst (C) of diffusion of the initial N and H in C, the rate of formation of NH_3 was measured by a method reported earlier (*C.A.* 45, 6030c) in an app. in which a mixt. of N and H (prepd. by pyrolysis of NH_3) contg. traces of NH_3 was passed through both sections of a stainless steel tube divided in the center by a porous tablet composed of C at temps. from 400° to 550° until equil. was attained; circulation was maintained by means of a circulating pump and could be stopped independently in either section. Data on the amt. of NH_3 produced are graphed as a function of temp. for initial NH_3 concns. from zero to 0.0336%. The activation energy for the synthesis of NH_3 was 36 kcal./mole. The rate const. varied from 0.23×10^{-4} at 420° to 8.0×10^{-4} at 530°. An equation is derived for the reaction rate that is in accord with the exptl. data. J. W. Loweberg, Jr.

(3)

USSR/Chemistry - Analysis methods

Card 1/1 Pub. 147 - 15/25

Authors : Royter, V. A., and Korneychuk, G. P.

Title : An approximate method of characterizing the macrostructure of porous catalysts

Periodical : Zhur. fiz. khim. 28/10, 1812-1819, Oct 1954

Abstract : An approximate method is introduced for the determination of macrostructure characteristics of various porous catalysts. The method is based on the analysis of experimentally derived values - porosity, effective coefficients of diffusion and gas-permeability - of the objects investigated. The effect of substance diffusion (from the periphery of the lump toward its center and vice versa), on the kinetics of the catalytic process in the case of homo- and heterogenic porous catalysts, is discussed. The method of determining the gas-permeability coefficient is described. Four USSR references (1940-1950). Drawings.

Institution : Acad. of Sc. Ukr-SSR, The L. V. Pisarzhevskiy Institute of Physical Chemistry, Kiev.

Submitted : March 1, 1954

DUMANSKIY, A.V., redaktor; MASHKARA, I.I., redaktor; OVCHARENKO, F.D.,
kandidat khimicheskikh nauk, redaktor; ROYTER, V.A., doktor
khimicheskikh nauk, professor, redaktor; SEDLETSKIY, I.D.,
doktor geologo-mineralogicheskikh nauk, redaktor; MIKHALYUK,
R.V., redaktor; KAZANTSEV, B.A., redaktor; SIVACHENKO, S.K.,
technicheskiy redaktor.

[Bentonite clays of the Ukraine; a collection of papers] Ben-
tonitovye gliny Ukrainy; sbornik. Kiev. Vol.1, 1955. 125 p.
(MLRA 9:5)

1. Deystvitel'nyy chlen AN USSR (for Dumanskiy). 2. Akademiya
nauk URSR, Kiyev. Rada vyvchennia produktivnykh syl.
(Ukraine--Bentonite)

2-1/6A, V N.

PISARZHEVSKIY, Lev Vladimirovich; BRODSKIY, A.I., redaktor; KORNEYCHUK, G.P., redaktor; ROYTER, V.A., redaktor; STUKANOVSKAYA, N.A. . redaktor; TITKOV, B.S., redaktor; SIVACHENKO, Ye.K., tekhnicheskij redaktor

[Selected works on catalysis] Izbrannye trudy v oblasti kataliza. Kiev, Izd-vo Akad.nauk USSR, 1955. 150 p. (MLRA 8:10)

1. Deystvitel'nyy chlen AN USSR (for Brodskiy)
(Catalysis)

AF701597

TREASURE ISLAND BOOK REVIEW

AID 814 - S

ROYTER, V. A. (Institute of Physical Chemistry, Academy of Sciences,
USSR)

DISKUSSIYA (Discussion). In Problemy kinetiki i kataliza (Problems of Kinetics and Catalysis), vol. 8. Izdatel'stvo Akademii Nauk SSSR, 1955. Section II: General problems on the theory of catalysis. p. 150-152.

Discussion of Voyevodskiy's paper. Royter points out that Voyevodskiy's explanation of catalysis by chain reactions is erroneous, since catalysis occurs also in the state of equilibrium while concentrations of atoms and radicals in chain reactions exceed the equilibrium concentrations. Thus, he postulates that catalysis may take place with the aid of radicals introduced by the catalyst or by chain reactions, or both. He also reports on his experiments with the decomposition of H_2O_2 which he explains by the electrochemical theory of catalysis. The catalyst transfers electrons from the donor to the acceptor. In the catalytic oxidation of CO to CO_2 on CuO (excess of O_2), a partial reduction of CuO takes place simultaneously with the process of catalysis. With increase in the concentration of O_2 , the reduction of CuO stops, and only catalysis takes place although CO is still present on the surface.

1/2

Royter, V. A.

USER/ Chemistry - Physical chemistry

Card 1/1 Pub. 116 - 1/24

Authors : Royter, V. A.

Title : Basic problems of the theory of heterogeneous catalysis and ways for their solution

Periodical : Ukr. khim. zhur. 21/2, 143-148, 1955

Abstract : The three basic closely connected problems of heterogeneous catalysis, namely, the kinetics of catalytic reaction, obtainment of catalysts with maximum activity and stable surface and, finally, the nature of catalytic acceleration, are discussed. The various theoretical concepts regarding the nature of catalysis are analyzed. Numerous ways are suggested for the solution of difficult problems pertaining to catalytic processes. Nine USSR references (1934-1954).

Institution : Acad. of Sc., Ukr. SSR, The L. V. Pisarzhevskiy Inst. of Phys. Chem.

Submitted : December 1, 1954

ROYTER, V.A.

Inaccuracies in some basic concepts of chemical kinetics. Ukr.khim.
zhur.21 no.3:296-299 '55. (MLRA 9:1)

1. Institut fizicheskoy khimii imeni L.V.Pisarzhevskogo.
(Chemical reaction, Rate of)

ROYTER, V. A.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 116 - 3/30

Authors : Royter, V. A.

Title : ~~XXXXXXXXXXXXXXXXXXXX~~
About the inaccuracy of certain basic concepts of chemical kinetics

Periodical : Ukr. khim. zhur. 21/3, 296-299, June 1955

Abstract : The inaccuracies in defining the ideas pertaining to the rate of reaction, energy and heat of activation are discussed. The concepts properly explaining the rate of chemical reaction, heat and energy of activation in static and thermodynamic sense are studied. It is pointed out that the knowledge of the values of entropy changes occurring during the conversion from the initial system into an active complex defining the phase of the reaction offers practical data regarding the orderliness of the active complex. One USSR reference (1953). Graph.

Institution : The L. V. Pisarzhevskiy Inst. of Phys. Chem.

Submitted : December 1, 1954

ROYTER, V.A.

The role of macrokinetic factors in catalytic naphthalene

oxidation processes on fused vanadium pentoxide. G. P.

Kornelchuk, Ya. V. Zhigallo, V. A. Roiter, and G. P.

Charkavenko. *Zhur Fiz Khim* 20, 1073 (1955) of C.A.

50, 12454. The porosity of an industrial fused V_2O_5 cata-

lyst sample was detd. by cutting diaphragms of 2.35 cm

diam. x 0.75 mm thick, and measuring the C_2H_4 diffusion rate

through them. The pores were 10^{-4} to 10^{-5} cm wide, and

the total surface exceeded by hundreds of times the surface

of the outer catalyst. The naphthalene oxidation proceeds

principally in the inner diffusion range, and changes over

to the outer diffusion range at 400°, and the change is ac-

companied by a sharp rise in the catalyst temp. Owing to

the diffusion difficulties in the inside catalyst pores, and to

increase in the contact time caused by it, the naphthalene

oxidation proceeds extensively in the inner pores, and the

role of the catalyst inner surface becomes less important at

the higher temps. (the reaction proceeding on the outer sur-

face). The catalyst selectivity rises. This selectivity

rise proceeds until, with the rise in the temp., the reaction

enters the outer diffusion range. This change is accom-

panied by a sharp temp. rise, and results in a renewed se-

lectivity decrease. The selectivity-temp. curve passes,

accordingly, through a max. at 400°, which corresponds,

apparently, to the outside kinetic reaction course, according

to the results obtained in the study, whereas the max.

efficiency in the phthalic anhydride industrial production

is at 420°.

W. M. Sternberg

Inst. Phys. Chem. in Riazan'skiy, PM
AS USSR,
Rubezhansk Chem. Combine, Min. Chem. Ind. USSR

STURANOVSKAYA, N. A., ROYTER, V. A., VAYNSHTEIN, F. M.

"Explanation of the Role of Oxygen of Vanadium Catalysts in the Oxidation of Sulfur Dioxide" (theses)

Problemy Kinetiki i Kataliza, v. 9, Isotopes in Catalysis, Moscow, 141-70
AS SSSR, 1957, 642p

Most of the papers in this collection were presented at the Conf. on
Isotopes in Catalysis which took place in Moscow, May 31 - June 5, 1956.

ROKNEYCHUK, G. P., ROYTER, V. A., STUKANOVSKAYA, N. A., RZAYEV, P. B., ZHIGAYLO, Ya. V.

"Study of the Effect of the Conditions of Catalysis on the Sulfur Content π in the Barium-Aluminum-Vanadium Sulfate Catalyst."

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 08-08-2001 BY 60322 UCBAW

This is the subject of a letter to the President of the Conf. on
 Education for the 21st Century dated 10/10/94.

ROYTER, V.A.
USSR/Physical Chemistry - Kinetics, Combustion, Explosions,
Topochemistry, Catalysis.

B-9

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 505
Author : V.A. Royter.
Inst :
Title : Macrokinetics of Contact Processes.
Orig Pub : Khim. nauka i prom-st', 1957, 2, No 2, 210-218
Abstract : Review.
Bibliography with 16 titles.

Card 1/1

AUTHORS: Royter, V. A., Corresponding Member AS Ukrainian SSR, 67-5-3/12
 Purovskiy, G. Ya., Engineer.

TITLE: Catalytic Method for Purifying Air From Acetylene (Kataliticheskiy metod
 ochildtki vozdukha ot atsetilena).

PERIODICAL: Kislород, 1957, Nr 5, pp. 14-22 (USSR).

ABSTRACT: Although there is no uniform opinion on the explosion mechanism in air
 fractionating apparatus, it is known that obstructions of hydrocarbons
 capable of reaction, especially of acetylene, cause these reactions.
 The impurity of the air is not always caused by neighbouring acetylene
 producing or - consuming plants (production of carbide, synthesis of
 products on acetylene basis, etc.). Also the quenching of furnace slags,
 the molding of metals at humid air and other processes during which a
 systematic contact between carbides produced as side products and water
 or steam takes place, can cause such impurities. Acetylene can enter
 compressed air also together with other hydrocarbons capable of reaction,
 which are in formed consequence of a partial cracking of lubricating oil
 in the overheating during the compression process. For overcoming these
 phenomena the authors suggest a catalytic method which was worked out by
 the Institute for Physical Chemistry AN USSR in collaboration with the
 VNIIMASH (All-Union Scientific Research Institute of Oxygen Apparatus

Card 1/3

Catalytic Method for Purifying Air from Acetylene.

67-5-3/12

and Machinery). Summary: 1. - The protection measures for oxygen apparatus taken at present - remote air intake and acetylene adsorber - can not secure a completely riskless operation. 2. - A catalytic method for the purification of the air from acetylene additions by means of oxidation with atmospheric-oxygen to CO_2 and H_2O was worked out. An effective and cheap catalyst of manganese-peroxide ore mixed with a small amount of silver was developed out. 3. - An important condition for the long life of a catalyst is the preliminary removal of drip oil and its vapors from the air to be purified. Its content must not be greater than its quantity at room temperature. 4. - A catalytic plant was designed, produced and tested. In this plant before passing the catalyst the oil is removed from the air by means of a filter with activated carbon at air temperature at the moment of its leaving the third stage of the compressor ($125\text{-}130^\circ\text{C}$). This type of plant has a great capacity but it makes necessary a subsequent removal of CO_2 . 5. - A catalytic plant for purification with recuperative heat exchange was designed, produced and tested. Its use made it possible to decrease the content of oil vapors without carbon filters and to reduce the consumption of energy for additional heating of the air. The experiments showed that at an air temperature of from $175\text{-}180^\circ\text{C}$ ($160\text{-}170^\circ\text{C}$ in the mass of the catalyst) on the occasion of the entrance into the contact apparatus this plant offers a

Card 2/3

Catalytic Method for Purifying Air from Acetylene.

67-5-3/12

complete protection of the fractionating block against acetylene in every practically possible concentration. About $2/3$ of the oil and of its distillates being in the air are oxidized to CO_2 and H_2O . 6. -

Based on the experimental results industrial plants for a simultaneous catalytic purification of the air from acetylene and oil distillates were designed for oxygen aggregates with a capacity of 30 and $300m^3/h$ of oxygen. The catalytic purification plant is mounted between the drying block and the fractionating apparatus. 7. - The catalytic method of the purification of air can be recommended for oxygen plants of small and medium capacity. With great low-pressure air fractionating plants the introduction of this method requires its supplementary elaboration in thermal respects and that taking into account the concrete possibilities of the individual enterprise. There are 4 figures, 2 tables and 4 Slavic references.

ASSOCIATION: All-Union Scientific Research Institute of Oxygen Apparatus and Machinery (VNIIMASH).

AVAILABLE: Library of Congress.

Card 3/3 1. Air-Purification-Catalytic-Processes

ROYTER, V.A.; VAYNSHTEYN, F.M.
STUKANOVSKAYA, N.S.;

The role of oxygen of vanadium catalysts in the oxidation of sulfur
dioxide gas (theses). Probl. kin. i kat. 9:133 '57. (MIRA 11:3)
(Oxidation) (Vanadium oxides) (Sulfur dioxide)

ROYTER, V. A.

73-2-8/22

AUTHORS: Ushakova, V.P., Korneychuk, G.P., Royter, V.A. and Zhigaylo, Ya. V.

TITLE: Kinetics and mechanism of the oxidation of naphthalene on a oxyvanadium catalyst. 1: Investigation of the effect of the gas phase composition on the chemical composition of the catalyst and on the catalytic activity.
(Kinetika i mekhanizm okisleniya naftalina na okisnovanadiyevom katalizatore. 1: Issledovaniye vliyaniya sostava gazovoy fazy na khimicheskiy sostav katalizatora i ego kataliticheskuyu aktivnost').

PERIODICAL: "Ukrainskiy Khimicheskiy Zhurnal" (Ukrainian Journal of Chemistry), Vol.23, No.2, March-April, 1957, pp.191-199 (USSR).

ABSTRACT: The possibility of poisoning of the catalysts at changing concentration of the reagents in the gaseous phase was investigated. A catalyst used in the plant reactor of the Rubezhansk Chemical factory was subjected to chemical analysis. V_2O_4 was determined with permanganate and V_2O_5 by titrating with ferrous ammonium sulphate. Tabulated results (Table 1) show that the catalyst is subjected to the biggest changes in the centre of the reactor. It

Card 1/3

73-2-8/22

Kinetics and mechanism of the oxidation of naphthalene on a oxyvanadium catalyst. 1: Investigation of the effect of the gas phase composition on the chemical composition of the catalyst and on the catalytic activity. (Cont.)

oxidation of phthalic anhydride is strongly inhibited by naphthalene vapours. The catalyst changes gradually in such a manner that the most suitable conditions for a selective process are established. The reduced particles come into contact with the highly concentrated naphthalene containing solution. The particles consist of slightly active higher vanadium oxides.

There are 2 drawings, 5 graphs and 3 tables. There are 3 references, 1 of which is Slavic.

ASSOCIATION: Institute of Physical Chemistry imeni L.V.Pisarzhevsk, Academy of Sciences, Ukraine. (Institut Fizicheskoy Khimii im. L.V.Pisarzhevskogo AN USSR).

SUBMITTED: November 12, 1956.

AVAILABLE: Library of Congress

Card 3/3

Royter, V. A.

73-3-5/24

AUTHOR: Ushakova, V. P., Korneychuk, G. P., and Royter, V. A.
TITLE: Kinetics and Mechanism of the Oxidation of Naphthalene
with a Vanadium Catalyst.2. (Kinetika i Mekhanizm
Okisleniya Naftalina na Okisnovanadiyevom Katalizatore. 2)
PERIODICAL: Ukrainskiy Khimicheskii Zhurnal, 1957, Vol.23, No.3,
pp. 310-321 (USSR).

ABSTRACT: Data on the kinetics of the oxidation of naphthalene
with a vanadium oxide catalyst are given. The detrimental
influence of the macrofactor was eliminated. The investi-
gations on the kinetics of the process disregarding some
of the chemical changes in the composition of the catalyst
were published in the first part of this article. (Ref.1.)
Experiments were carried out on a macrocrystalline, non-
porous vanadium oxide catalyst (2 grains 5 x 7mm weighing
0.495 g) between 380 - 410°C, by the continuous circulation
method, as indicated in Figure 1. The macro-crystalline
catalyst was prepared by slow cooling of the vanadium
pentoxide solution. The internal diffusion was minimised
by using this catalyst. The rate of oxidation of naph-
thalene was measured at 383, 392, 400 and 410°C. Prelimi-
nary experiments showed that the catalyst shows sufficient-
ly reproducible activity in these temperature limits;
outside these temperature limits the catalytic activity

Card 1/5

73-3-5/24

Kinetics and Mechanism of the Oxidation of Naphthalene with a Vanadium Catalyst. 2.

and selectivity of the material changes. Quantitative analysis of the oxidation products gave the following results: phthalic anhydride, maleic anhydride, 1,4-naphthoquinone, CO_2 , CO and O_2 . The unreacted naphthalene was determined by the difference between the initial concentration and the concentration of the reaction products. The analysis of the gaseous products was carried out in the apparatus BTM, the 1,4-naphthoquinone was analysed with a ϕ K-53 photocolormeter. Investigations were carried out at 0.505×10^{-3} mole/litre (1:20, I series) and 0.342×10^{-3} mole/litre (1:30, II series). Figures 2-5 give data on the relation of the output and the concentration of phthalic anhydride ($W_{P,a}$), maleic anhydride ($W_{m,a}$), 1,4-naphthoquinone ($W_{n,q}$) and of products of deep oxidation (W_{CO_2}). The concentration of naphthalene was denoted by C_n . The kinetics of oxidation can be expressed by the equation: $W_{P,a} = k_{Ph} C_n$. The velocity constants of these partial reactions, calculated on the basis of the given equations in Table 1. are shown

Card 2/5 to be reasonably constant in the given temperature limits.

73-3-5/24

Kinetics and Mechanism of the Oxidation of Naphthalene with a Vanadium Catalyst. 2.

The rate of formation of phthalic anhydride does not depend on the concentration of the reaction products and at a constant concentration of oxygen only the naphthalene concentration has to be defined. The activation temperatures were calculated from the inclination of diagram lines $\lg k_i$ and $\frac{1}{T}$ (figures 6 - 9). The following results were obtained (in cal./mole):

$E_{\text{Ph.a.}} = 37.4$; $E_{\text{M.a.}} = 31.6$; $E_{\text{N.qu.}} = 32.7$ and $E_{\text{CO}_2} = 37.2$

A second series of experiments with smaller initial concentration of naphthalene than in the first series was carried out to clarify the total influence of the reaction products on the rate of oxidation of naphthalene (0.342×10^{-3} mole/litre). These investigations were carried out at 410, 392 and 383°C with the same catalyst as in the first series. Practically identical results were obtained. The mean values of the velocity constants were calculated according to the equations 1 - 4 given in Table 2. Figure 10 shows that the relation of output of phthalic anhydride and the concentration naphthalene of the 2 experimental series tally during each given

Card 3/5

Kinetics and Mechanism of the Oxidation of Naphthalene with a
Vanadium Catalyst. 2.

73-3-5/24

initial oxy-compounds or 1,4-naphtoquinone. There are
13 figures, 3 tables and 13 references, 9 of which are
Slavic.

SUBMITTED: November, 12, 1956.

ASSOCIATION: Institute of Physical Chemistry imeni L.V. Pisarzhev-
skiy, Academy of Sciences, Ukrainian SSR.
(Institut Fizicheskoy Khimii im. L.V. Pisarzhevskogo
AN USSR)

AVAILABLE: Library of Congress.

Card 5/5

Distr. 4541/4531/4520(1) 7
 Kinetics and mechanism of oxidation of naphthalene on a
 vanadium oxide catalyst. I. V. P. Ushakova, G. P.
 Kornelchuk, and V. A. Rollet. *Ukrain. Khim. Zhur.* 23,
 810-12(1957) (in Russian); *C.A.* 51, 12623d. Mixts. of
 $C_{10}H_8$ and air were circulated over coarsely cryst. V_2O_5 in
 order to avoid effects of diffusion within the catalyst.
 The rates of formation of the following products were pro-
 portional to the given powers of the concn. of $C_{10}H_8$:
 $C_{10}H_6(CO)_2O$ (I) and CO_2 , 1st; maleic anhydride (II), 0.5;
 1,4-naphthoquinone (III), 2nd. The rate of formation of I is
 not dependent on the concn. of intermediate products, but
 the rate of formation of II is increased, and that of CO and
 CO_2 is decreased. It is proposed that I, II, and III are all pro-
 duced directly from $C_{10}H_8$ as well as II from I and I from III.
 The initially formed product, perhaps the 2,3-dihydroxy
 deriv. of III or 1,2,3,4- $C_{10}H_6(OH)_4$, interferes with the oxida-
 tion to CO_2 by maintaining a surface coating of lower oxide.
 The activation energies in kcal./mole of I, II, III, and CO_2
 are 37.4, 31.3, 32.7, and 37.2, resp. John Howe Scott

5
 2 May
 3

8/11

5(3,4)

AUTHORS:

Korneychuk, G. P., Royter, V. A.,
Zhigaylo, Ya. V.

SOV/64-58-7-6/18

TITLE:

Methods of Improving the Capacity and Selectivity of Vanadium Oxide Catalysts in the Oxidation of Naphthalene to Phthalic Anhydride (Puti povysheniya proizvoditel'nosti i izbiratel'nosti okisnovanadiyevykh katalizatorov dlya okisleniya naftalina vo ftalevyy anhidrid)

PERIODICAL:

Khimicheskaya promyshlennost', 1958, Nr 7, pp 410-413 (USSR)

ABSTRACT:

I. P. Garkavenko and N. A. Konstantinova took part in the experiments. The small pore dimensions (diameter 10^{-4} to 10^{-5} cm) in fused vanadium pentoxide catalysts lead to diffusion inhibitions in the naphthalene oxidation. In the reaction the pentoxide in the naphthalene-air mixture is reduced to lower oxides. A disadvantage of the vanadium pentoxide catalysts is also the low melting-point of V_2O_5 (690°). To avoid the effect of the diffusion inhibitions mentioned above some experiments were carried out. The V_2O_5 was fused and tabletted. Besides, experiments with coarsely crystalline V_2O_5 were carried out. The time of contact was selected in such a way that no naphthalene could be proved in the outflow of the reactor at the

Card 1/2

Methods of Improving the Capacity and Selectivity of SOV/64-58-7-6/18
Vanadium Oxide Catalysts in the Oxidation of Naphthalene to Phthalic Anhydride

temperature of the experiment (indicator method) (Ref 5). Carbon monoxide and carbon dioxide were determined in the gas analyzer of the type VTI (Ref 6). The gas quantity was measured in a Mariotte (Mariot) container. The reaction products were collected in a Deward (D'yuard) container (with freezing mixture). It was found that at temperatures below 400° the monocrystalline non-porous catalyst is by far more efficient than the ordinary fused catalyst. A partly reduced catalyst had the advantage of a higher melting temperature than vanadium pentoxide. The following facts were found: The first part of the reactor (1/4 - 1/3) should be filled with a partly reduced catalyst (granulation 7-8 mm). The rest of the reactor is filled with coarsely crystalline V₂O₅ as the latter has a greater selectivity than the porous polycrystalline industrial catalyst. The temperature of the catalysis should be maintained at 380-400°, and a maximum rate of the gas flow should be employed where no passage of non-oxidized naphthalene can take place yet. There are 3 figures, 1 table, and 7 Soviet references.

Card 2/2

ROYTER, V.A.; STUKANOV, N.A.; VOLIKOVSKAYA, N.S.

Role of oxygen in vanadium oxide catalysts during oxidizing
catalysis. Ukr. khim. zhur. 24 no.1:37-45 '58. (MIRA 11:4)

1. Institut fizicheskoy khimii im. L.V. Pisarzhevskogo AN USSR.
(Vanadium oxide) (Oxidation) (Catalysis)

5(4), 5(1)
AUTHORS:

SOV/76-32-11-10/32
~~Royter, V. A.~~, Korneychuk, G. P., Stukanovskaya, N. A.,
Rzayev, P. B.

TITLE:

The Effect of the Transport Phenomena on the Kinetics of the Oxidation of Sulfur Dioxide Gases on the Barium-Aluminum-Vanadate Catalyst (Vliyaniye yavleniy perenosa na kinetiku okisleniya sernistogo gaza na bariyevo-alyumo-vanadiyevom katalizatore) I. Investigations According to the Diaphragm Method (I. Issledovaniye metodom diafragm)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 11, pp 2525-2531 (USSR)

ABSTRACT:

The kinetics mentioned in the title has already been investigated by some authors (Refs 1,2,3). In the present case the diaphragm method is employed and the equation by G. K. Boreskov (Ref 3) is modified for the conditions of this method (Ref 4). The operation mechanism of this method has already been described (Refs 4-6). A schematic representation of the test plant (Fig 1) as well as a diagram of the vessel for sample taking of the gases (Fig 3) are given. A reactor apparatus of quartz (Ref 10) was used. The diaphragms (from a

Card 1/3

SOV/76-32-11-10/32

The Effect of the Transport Phenomena on the Kinetics of the Oxidation of Sulfur Dioxide Gases on the Barium-Aluminum-Vanadate Catalyst. I. Investigations According to the Diaphragm Method

barium-aluminum-vanadate contact mass) were 0.64 cm thick, had a diameter of 1.78 cm and a weight of 1.499 g. The experimental data were obtained for three initial concentrations of the SO_2 gas in air (2.43; 4.78; 6.42%) at temperatures of 430-530°C² (Table 2). The activation energy of the oxidation process of SO_2 on barium-aluminum-vanadate catalysts amounts to from 36 to 39 kcal/mol, and thus is considerably higher than the value (23 kcal/mol) given by G. K. Boreskov. This is regarded as a proof of the assumption of the important effect of the transport factor also in the case of fine-grained catalysts. There are 8 figures, 2 tables, and 12 references, 11 of which are Soviet.

ASSOCIATION: Akademiya nauk Ukrainskoy SSR, Institut fizicheskoy khimii im. L. V. Pisarzhevskogo, Kiyev (Academy of Sciences, Ukrainskaya SSR, Institute of Physico-Chemistry imeni L. V. Pisarzhevskiy, Kiyev)

Card 2/3

STANIN, V. G.; KORNICHENKO, G. P.; LOYTO, V. A.

Kinetics of catalytic oxidation of sulfur dioxide on vanadium pentoxide. Ukr. khim. zhurn. 30 no.9:919-925 '64.

(MIRA 17:10)

1. Institut fizicheskoy khimii imeni Pisarzhevskogo AN UkrSSR.

GELIER, B.A.; NEYMARK, I.Ye.; RUBANIK, M.Ya.; GRAGEROV, I.P.; POLYAKOV,
M.V.; RUSOV, M.T.; DAIN, B.Ya.; REKASHEVA, A.F.; STRAZHESKO,
D.N.; LUNENOK, V.A.; ROYTER, V.A.; SULIMA, L.V.; FOMENKO, A.S.

Aleksandr Il'ich Brodskii, 1895- ; on his seventieth birthday.
Zhur. fiz. khim. 39 no.6:1540-1541 Je '65. (MIRA 18:11)

PYATNITSKIY, Yu.I.; STUKANOVSKAYA, N.A.; ROYTER, V.A.

Kinetics of ammonia decomposition on an iron catalyst
under conditions of chemical equilibrium. Ukr. khim.
zhur. 31 no.3:247-252 '65.

(MIRA 18:4)

1. Institut fizicheskoy khimii im. L.V.Pisarzhevskogo AN
UkrSSR.

ROYTER, V.A. [Roiter, V.A.], akademik

Reaction and catalysis. Nauka i zhyttia 12 no.7:33-34 J1 '62.
(MIRA 16:1)

1. AN UkrSSR.

(Catalysts)

GOLODETS, G.I.; ROYTER, V.A.

Selection of catalysts based on the thermodynamic characteristics
of substances and reactions. Ukr. khim. zhur. 29 no.7:667-685 '63.
(MIRA 16:8)

1. Institut fizicheskoy khimii im. L.V. Pisarzhevskogo AN UkrSSR.
(Catalysts) (Thermodynamics)

GOLODETS, G.I.; ROYTER, V.A.

Using empirical kinetic equations for the estimation of the
thermodynamic characteristics of active complexes. Kin.i kat.
(MIRA 16:5)
4 no.2:177-188 Mr-Apr '63.

1. Institut fizicheskoy khimii imeni L.V.Pisarzhevskogo AN UkrSSR.
(Chemical reaction, Rate of)
(Complex compounds—Thermodynamic properties)

BAKUMENKO, Tamara Timofeyevna; ROYTER, V.A., akademik, otv. red.;
POKROVSKAYA, Z.S., red.; KADASHEVICH, O.A., tekhn. red.

[Catalytic properties of rare and rare-earth elements]Kataliticheskie svoistva redkikh i redkozemel'nykh elementov. Kiev, Izd-vo Akad.nauk USSR, 1963. 99 p.
(MIRA 16:4)

1. Akademiya nauk UkrSSR (for Royter).
(Metals, Rare and minor) (Rare earths) (Catalysis)

ROYTER, Vladimir Andreyevich; KORNEYCHUK, Grigoriy Petrovich;
USHAKOVA, Viktorina Petrovna; STUKANOVSKAYA, Nina
Aleksandrovna; POKROVSKAYA, Z.S., red.; MATVBYCHUK, A.A.,
tekhn. red.

[Catalytic oxidation of naphthalene] Kataliticheskoe okislenie
naftalina. Kiev, Izd-vo Akad. nauk RSSR, 1963. 106 p.
(MIRA 16:5)

(Naphthalene) (Oxidation) (Vanadium catalysts)

ROYTER, Vladimir Andreyevich; BRODSKIY, AI., akademik, otv. red.;
POKROVSKAYA, Z.S., red.; DAKHNO, Yu.B., tekhn. red.

[Introduction to the theory of kinetics and catalysis] Vvedenie
v teoriyu kinetiki i kataliza. Kiev, Izd-vo Akad. nauk USSR,
1962. 110 p. (MIRA 16:1)

1. Akademiya nauk Ukr. SSR (for Brodskiy).
(Kinematics) (Catalysis)

ROYTER, V.A.

Methods for taking into account the distorting effect of macro-
factors in the determination of catalyst activity. Kin.i kat.
3 no.4:602-604 J1-Ag '62. (MIRA 15:8)

1. Institut fizicheskoy khimii imeni L.V.Pisarzhevskogo AN USSR.
(Catalysis)

ROYTER, V.A.

All-Union Conference on methods for the determination of catalyst
activity. Kin.i kat. 3 no.4:467-469 J1-Ag 62. (MIRA 15:8)
(Catalysts—Congresses)

ROYTER, V.A.; USHAKOVA, V.P.; KORNEYCHUK, G.P.; SKORBILINA, T.G.

Kinetics and mechanism of the catalytic oxidation of naphthalene to 1,4-naphthoquinone. Kín. i kat. 2 no.1:94-102 Ja-F '61. (MIRA 14:3)

1. Institut fizicheskoy khimii imeni L.V. Pisarzhevskogo AN USSR.
(Naphthalene) (Naphthoquinone) (Chemical reaction, Rate of)

ROYTER, V.A.

Role of stages in mechanism of catalytic acceleration. Ukr. khim.
zhur. 27 no.2:135-138 '61. (MIRA 14:3)

1. Institut fizicheskoy khimii im. L. V. Pisarzhevskogo AN USSR.
(Catalysis)

ROYTER, V.A.; STUKANOVSKAYA, N.A. [Stukanovska, N.O.]; KORNEYCHUK, G.P.
[Kornichuk, H.P.]; VOLIKOVSKAYA, N.S. [Volikovska, N.S.];
GOLODETS, G.I. [Golodets', H.I.]

Study of the kinetics of oxidation of sulfur anhydride on a platinum
catalyst under conditions of stable chemical equilibrium. Dop.AN
URSR no.9:1241-1244 '60. (MIRA 13:10)

1. Institut fizicheskoy khimii im. L.V.Pisarzhevskogo AN USSR.
2. Chlen-korrespondent AN USSR (for Royter).
(Oxidation) (Sulfur oxides)

VOL'FSON, V.Ya.; KORNEYCHUK, G.P.; ROYTER, V.A.; ZHIGAYLO, Ya.V.

Characteristics of the catalytic oxidation of naphthalene. Part
3: Kinetics of naphthalene oxidation in long beds of vanadium
catalysts. Ukr. khim. zhur. 26 no.5:588-593 '60. (MIRA 13:11)

1. Institut fizicheskoy khimii im.L.V.Pisarzhevskogo AN USSR i
Rubezhanskiy khimicheskiy kombinat.
(Naphthalene) (Oxidation)

ROYTER, V.A.; STUKANOVSKAYA, N.A.; KORNEYCHUK, G.P.;
VOLIKOVSKAYA, N.S.; GOLODETS, G.I.

Study of the oxidation kinetics of sulfur dioxide on a platinum
catalyst when equilibrium has been reached. Kin. i kat. 1
no. 3:408-417 S-O '60. (MIRA 13:11)

1. Institut fizichiskoy khimii imeni I.V. Pisarzhevskogo AN USSR.
(Sulfur dioxide) (Oxidation) (Platinum)

S/073/60/026/002/002/015
B023/B067

AUTHORS: Rzayev, P. B., Royter, V. A., and Korneychuk, G. P.
TITLE: On the Kinetics of Sulfuric Acid Catalysis on Barium-Aluminum - Vanadium Catalysts
PERIODICAL: Ukrainskiy khimicheskiy zhurnal, 1960, Vol. 26, No. 2, pp. 161-167

TEXT: The authors studied the oxidation kinetics of sulfur dioxide on a barium - aluminum - vanadium catalyst. They observed that it corresponds to the equation by G. K. Boreskov (Ref. 3) with the exponent $n = 0.4$. The high value of activation heat (23 kcal) is due to the internal kinetic conditions and is not influenced by the macrofactors. The authors proved that an inhibition of internal diffusion influences already small grains of a diameter of 1.5 - 2 mm with a degree of conversion of $< 70\%$ and a temperature of $< 500^{\circ}\text{C}$ which reduces the measurable activation heat. Furthermore they showed that inspite of the large difference in the degree of reduction of the vanadium oxides contained in the catalyst, its activity practically remains constant. The authors describe the possible

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On the Kinetics of Sulfuric Acid Catalysis on
Barium - Aluminum - Vanadium Catalysts

S/073/60/026/002/002/015
B023/B067

reasons of the overestimated values of the activation heat which were obtained by the diaphragm method. They attempt to explain the divergence between their data and the data of Ye. V. Gerburt-Geybovich and G. K. Boreskov. They assume that the composition of the catalyst which can be determined by chemical analysis, gradually changes, whereas the surface layer rapidly takes the composition corresponding to the gaseous medium. For this reason, catalysts with different degree of oxidation, at given temperature and given composition of the gas, have the same chemical composition of the surface layer and the same activity. This assumption, however, has not yet been proved. Also systematic errors may occur when employing the diaphragm method. This should be the subject of further studies. There are 6 figures, 3 tables, and 5 Soviet references.

ASSOCIATION: Institut fizicheskoy khimii im. L. V. Pisarzhevskogo AN USSR
(Institute of Physical Chemistry imeni L. V. Pisarzhevskiy
of the Academy of Sciences UkrSSR)

SUBMITTED: August 11, 1959

Card 2/2

S/073/60/026/004/010/016/XX
B023/B064

AUTHORS: Korneychuk, G.P., Royter, V.A., Vol'fson, V.Ya.,
Zhigaylo, Ya.V. and Lyubiteleva, A.Z.

TITLE: Characteristics of the Catalytic Oxidation of Naphthalene.
2. Investigations of the Oxidation of Naphthalene in Long
Layers of Vanadium Catalysts

PERIODICAL: Ukrainskiy khimicheskiy zhurnal, 1960, Vol. 26, No. 4
pp. 432-439


TEXT: The authors performed a comparative investigation between the combined charge suggested by them (it consists of a partly reduced vanadium oxide catalyst and a coarse-crystalline vanadium pentoxide, Ref.2) and the catalysts used in industry. Along with this investigation the efficiency and selectivity of the naphthalene oxidation was studied on the basis of the products obtained, and the temperature conditions prevailing along the layer were examined. By means of an enlarged plant and a commercial reaction apparatus the authors obtained data proving that the combined charge of vanadium oxide catalysts is superior to the

Card 1/3

Characteristics of the Catalytic Oxidation
of Naphthalene. 2. Investigations of the
Oxidation of Naphthalene in Long Layers of
Vanadium Catalysts

S/073/60/026/004/010/018/XX
B023/B064

commercial reaction apparatus of vanadium pentoxide. Under these conditions the phthalic anhydride yield reached 80-85%. Under worse conditions of heat reduction and temperature balance in the commercial reaction apparatus the selectivity of the combined charge amounts to 76-78% (that of the industrial being 69-70%). Thus, the naphthalene consumption is reduced by 25%. The efficiency of the catalysts did not decrease. Data were obtained on the efficiency and selectivity of the vanadium catalyst with respect to phthalic- and maleic anhydride. The optimum experimental conditions, the change of the naphthalene concentration, its oxidation products and temperature were determined by taking samples along the layer of the vanadium catalysts. The authors found that at a given temperature and concentration of naphthalene in the gas mixture an optimum flow rate exists, which warrants a maximum yield of phthalic anhydride. It corresponds to the maximum velocity at which no naphthalene leaves the output of the plant. The method applied, in combination with the indicator method which serves to determine the naphthalene which has not entered into reaction, is suited for a quick and reliable evaluation of



Card 2/3

RZAYEV, P.B.; ROYTER, V.A.; KORNEYCHUK, G.P.

Kinetics of sulfuric acid catalysis on barium-aluminum-vanadium catalysts. Ukr. khim. zhur. 26 no.2:161-167 '60.
(MIRA 13:9)

1. Institut fizicheskoy khimii im. L.V. Pisarzhevskogo AN USSR.
(Sulfur dioxide) (Catalysts)

ROYTER, V.A.

Mechanism of oxidative catalysis by means of metal oxides. Kin.
i kat. 1 no.1:63-68 My-Je '60. (MIRA 13:8)

1. Institut fizicheskoy khimii im. L.V. Pisarzhevskogo AN USSR.
(Metallic oxides) (Catalysis)

ROYTER, V.A.; KORNEYCHUK, G.P.[Korniichuk, H.P.]; VOL'FSON, V.YA.;
ZHIGAYLO, Ya.V.[Zhyhailo, IA.V.]

Kinetics of the oxidation of naphthalene in commercial
layers of vanadium catalysts. Dop.AN URSS no.3:345-348
'60. (MIRA 13:7)

1. Institut fizicheskoy khimii im. L.V.Pisarzhevskogo AN USSR
i Rubizhanskiy khimicheskoy kombinat. 2. Chlen-korrespondent
AN USSR (for Royter).
(Naphthalene) (Oxidation)

VOL'FSON, V. Ya., KORNEYCHUK, G. P., ROYTER, V. A.

Characteristics of the catalytic oxidation of naphthalene. Part 1:
Kinetics of oxidation of phthalic anhydride on a vanadium oxide
catalyst. Ukr. khim. zhur. 26 no. 3:305-313 '60.
(MIRA 13:7)

1. Institut fizicheskoy khimii AN USSR.
(Phthalic anhydride) (Vanadium oxide)
(Oxidation)

OVCHARENKO, F.D., otv.red.; KURILENKO, O.D., doktor khim.nauk, red.;
NEYMARK, I.Ye., doktor khim.nauk, red.; ROYTER, Y.A., red.;
MIKHALYUK, R.V., kand.khim.nauk, red.; MEL'NIK, A.F., red.
izd-va; MATVEYCHUK, A.A., tekhn.red.

[Natural mineral sorbents; proceedings of the conference held
June 9-12, 1958 in Kiev] Prirodnye mineral'nye sorbenty;
trudy soveshchaniia, sostoiavshegosia 9-12 iunია 1958 goda
v g. Kieve.. Kiev, 1960. 370 p. (MIRA 13:7)

1. Soveshchaniye po prirodnym mineral'nym sorbentam, Kiev, 1958.
2. Chleny-korrespondenty AN USSR (for Ovcharenko, Royter).
(Sorbents)

S/195/60/001/001/004/007
B015/B060

AUTHOR: Royter, V. A.

TITLE: The Mechanism of Oxidative Catalysis by Means of Metal Oxides

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No. 1, pp. 63-68

TEXT: The present paper offers a survey of the work done at the author's laboratory for the purpose of checking the two-stage redox reaction scheme of catalysis. Some typical oxidation processes and catalysts traced with O^{18} were examined. Data on the following reactions are supplied and tabulated: catalytic oxidation of CO on MnO_2 ; catalytic oxidation of CO on CuO ; catalytic oxidation of naphthalene on V_2O_5 ; catalytic oxidation of SO_2 on V_2O_5 . Experimental results obtained from the above reactions show that on the oxidation catalysis by metal oxides the oxygen of the latter does not reach the reaction products, and hence, the two-stage redox reaction scheme of catalysis is incorrect. Boreskov and others, Roginskiy and Keyer are mentioned in the text. [Abstracter's

Card 1/2

✓B

The Mechanism of Oxidative Catalysis by Means
of Metal Oxides

S/195/60/001/001/004/007
B015/B060

Note: the pages following p. 67 of this paper's photographic copy were missing]. There are 8 tables and 8 references: 7 Soviet and 1 US.

ASSOCIATION: Institut fizicheskoy khimii im. L. V. Pisarzhevskogo
AN USSR (Institute of Physical Chemistry imeni
L. V. Pisarzhevskiy AS UkrSSR)

SUBMITTED: December 3, 1959

✓B

Card 2/2

RUSSIAN UNIVERSITY, E. E.

PHASE I BOOK EXPLOITATION

SOV/5658

Ivanov, Aleksandr Petrovich, Candidate of Technical Sciences, and
Viktor Dmitriyevich Lisitsyn, Candidate of Technical Sciences,
eds.

Modernizatsiya kuznechno-shtampovogo oborudovaniya (Moderni-
zation of Die-Forging Equipment) Moscow, Mashgiz, 1961. 226 p.
Errata slip inserted. 10,000 copies printed.

Reviewer: V. Ye. Nedorezov, Candidate of Technical Sciences; Ed.
of Publishing House: T. L. Leykina; Tech. Ed.: A. A. Bardina;
Managing Ed. for Literature on Machine-Building Technology
(Leningrad Department, Mashgiz): Ye. P. Naumov, Engineer.

PURPOSE: This book is intended for foremen, machinists, designers,
and process engineers concerned with the modernization and de-
signing of die-forging equipment. It may also be used by students
at schools of higher education.

COVERAGE: The book contains material presented at the Conference

Card 1/8

Modernization of Die-Forging Equipment

27
SOV/5658

on Problems in the Modernization and Operation of Die-Forging Equipment, held in November 1958 in Leningrad. The Conference was called by Leningradskiy Sovet narodnogo khozyaystva, Sektsiya obrabotki metallov davleniyem Leningradskogo oblastnogo pravleniya NTO Mashprom (Leningrad Council of the National Economy, Section of Metal Pressworking at the Leningrad Oblast Board of the Scientific and Technical Society of the Machine Industry) and Leningradskiy mekhanicheskii institut (Leningrad Mechanical Engineering Institute). Actual problems in the modernization, operation, and repair of die-forging equipment are described. Analyses are provided for problems involved in the mechanization and automation of die-forging and stamping operations. Also included are practical data to be used in the modernization of equipment. No personalities are mentioned. There are 59 references: 56 Soviet, 2 German, and 1 English.

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Foreword

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S/073/60/026/003/006/011/XX
B023/B060

AUTHORS: Vol'fson, V. Ya., Korneychuk, G. P., and Royter, V. A.

TITLE: Characteristic Features of the Catalytic Oxidation of Naphthalene. I. Kinetics of the Oxidation of Phthalic Anhydride on a Vanadium Oxide Catalyst

PERIODICAL: Ukrainskiy khimicheskiy zhurnal, 1960, Vol. 26, No. 3, pp. 305-313

TEXT: The authors studied the kinetics of oxidation of phthalic anhydride on a coarse-crystalline vanadium oxide catalyst under conditions excluding the distorting effect due to diffusion. The concomitant reactions were found to obey the following kinetic equations: the reaction rate of maleic anhydride formation $W_1 = k_1 \cdot C_{phth} \cdot a / C_{prod}$, the reaction rate of intensive oxidation of phthalic anhydride $W_2 = k_2$, where k_1 , k_2 are the rate constants, C_{prod} the total concentration of oxidation products of phthalic anhydride in the reaction zone. The activation heat of the formation reaction of maleic anhydride was calculated on the basis of the Arrhenius equation and

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was found to be $E = 58.12$ kcal/mole. The factor B_1 of the exponential function was found to be $B_1 = 1.18 \cdot 10^{11}$. For the reaction of the intensive oxidation of phthalic anhydride $E_2 = 40.92$ kcal/mole and $B_2 = 2.45 \cdot 10^5$.

A comparison between the authors' own results and the data offered by the literature showed that one of the factors ensuring the high selectivity of the catalytic process of producing phthalic anhydride from naphthalene is the high stability of phthalic anhydride toward oxidation (Ref. 4). The discrepancy between the partial reactions of phthalic anhydride and the reactions of its complete oxidation appears incomprehensible at first. The zero order of the reaction of the intensive oxidation of phthalic anhydride gives ground to the assumption of the catalyst surface being saturated by phthalic anhydride. The first order of the formation reaction of maleic anhydride from phthalic anhydride presupposes that there is no such saturation. This contradiction is disposed of when one assumes that, firstly, the reaction of the intensive oxidation of phthalic anhydride requires the combination of a phthalic anhydride molecule with oxygen, while

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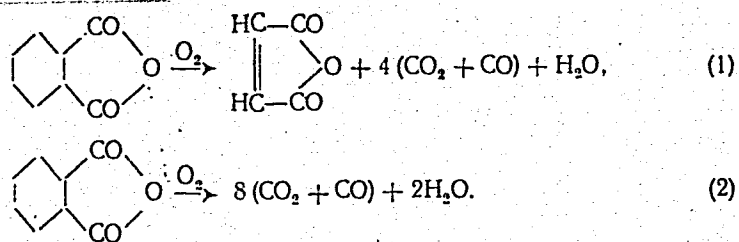
Characteristic Features of the Catalytic Oxidation of Naphthalene. I. Kinetics of the Oxidation of Phthalic Anhydride on a Vanadium Oxide Catalyst S/073/60p26/003/006p11/XX B023/B060

the reaction of the partial oxidation requires the combination of two phthalic anhydride molecules with oxygen; that, secondly, the catalyst surface is inhomogeneous and only its active centers are saturated with phthalic anhydride. The reaction of intensive oxidation taking place on these active centers is actually independent of the concentration of the product to be oxidized. At the same time, the rate of the reaction of partial oxidation of phthalic anhydride is certainly dependent upon its concentration in the volume or at the less active places and is inhibited by the reaction products which render the access of phthalic anhydride to the place of reaction more difficult. The discrepancy observed here has been observed and described already earlier (Refs. 2, 3, and 6). The attached scheme serves to illustrate reactions taking place in the oxidation of phthalic anhydride. There are 9 figures, 2 tables, and 7 references: 6 Soviet and 1 US.

ASSOCIATION: Institut fizicheskoy khimii AN USSR
(Institute of Physical Chemistry of the AS UkrSSR)

SUBMITTED: June 7, 1959
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S/073/60/026/005/007/019
B004/B063

AUTHORS: Vol'fson, V. Ya., Korneychuk, G. P., Royter, V. A.,
Zhigaylo, Ya. V.

TITLE: Peculiarities of the Catalytic Oxidation of Naphthalene.
3. Kinetics of the Oxidation of Naphthalene in Long Layers
of Vanadium Catalysts

PERIODICAL: Ukrainskiy khimicheskiy zhurnal, 1960, Vol. 26, No. 5,
pp. 588-593

TEXT: The purpose of the present work was to obtain data on the mechanism underlying the oxidation of naphthalene on vanadium catalysts under conditions comparable to those applied in industry. The following catalysts were used: 1) a commercial catalyst from molten V_2O_5 ; 2) a "combined mixture" with partly reduced V_2O_5 . This catalyst had been suggested by the authors in Ref. 3; 3) tablets of the commercial vanadium-potassium sulfate-silica gel catalyst (combined vanadium catalyst). Each experiment took 12-14 h. 2-3 h before the end of the experiment, samples were taken along

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Peculiarities of the Catalytic Oxidation of
Naphthalene. 3. Kinetics of the Oxidation of
Naphthalene in Long Layers of Vanadium Catalysts

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B004/B063

the catalyst layer, which were used to study the variations in concentration of naphthalene, naphthoquinone, maleic anhydride, CO_2 , and CO . It was found that the partial reactions occurring during the oxidation of naphthalene on V_2O_5 catalysts obey the following kinetic equations:

1) $v_1 = k_1 C_n$ (formation of phthalic anhydride); $k_1 = 4.5 \cdot 10^{-3} - 4.6 \cdot 10^{-3}$;
 C_n = concentration of naphthalene. 2) $v_2 = k_2 \cdot C_n^{0.5}$ (formation of maleic anhydride); $k_2 = 0.0665 \cdot 10^{-5} - 0.0835 \cdot 10^{-5}$. 3) $v_3 = k_3 \cdot C_n^2$ (formation of naphthoquinone); $k_3 = 54 - 47.5$ [Abstracter's note: Obviously a misprint].
4) $v_4 = k_4 \cdot C_{nq}$ (oxidation of naphthoquinone); $k_4 = 2.47 \cdot 10^{-3} - 2.55 \cdot 10^{-3}$;
 C_{nq} = concentration of naphthoquinone. 5) $v_5 = k_5 \cdot C_n$ (formation of products on account of intense oxidation); $k_5 = 1.10 \cdot 10^{-3} - 1.5 \cdot 10^{-3}$. The partial reactions occurring during oxidation on the combined vanadium catalyst obey the following equations: 1) $v_6 = k_6$ (formation of phthalic anhydride);

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L 10793-66 EWT(d)/EWT(m)/EWP(w)/EWP(v)/EWP(k)/EWA(h)/ETC(m) LJP(c) WW/EM/GS
 ACC NR: AT6001080 SOURCE CODE: UR/0000/65/000/000/0023/0033

AUTHORS: ^{44, 55} Vaynberg, D. V.; ^{44, 55} Gerashchenko, V. M.; ^{44, 55} Roytfarb, I. Z.; ^{44, 55} Sinyavskiy, A. L. ⁵⁵

ORG: ^{44, 55} Kiev Structural Engineering Institute (Kiyevskiy inzhenerno-stroitel'nyy institut) ⁵⁴
²⁶ B+1

TITLE: A summary of network equations of plate deflection by the variational method

SOURCE: Soprotivleniye materialov i teoriya sooruzheniy (Strength of materials and the theory of structures), no. 1. Kiev, Izd-vo Budivel'nyk, 1965, 23-33

TOPIC TAGS: stress analysis, thin plate, structural analysis, network structural analysis, finite difference method

ABSTRACT: ^{16, 44, 55} A method of applying network equations for plate deflection problems is developed. A thin plate, such as that shown in Fig. 1, is considered. ²⁶

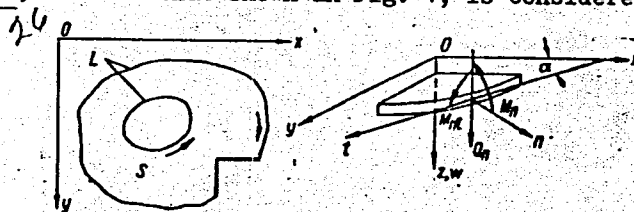


Fig. 1.

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